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U.S. Department of Energy Standardized Radiation Safety Training

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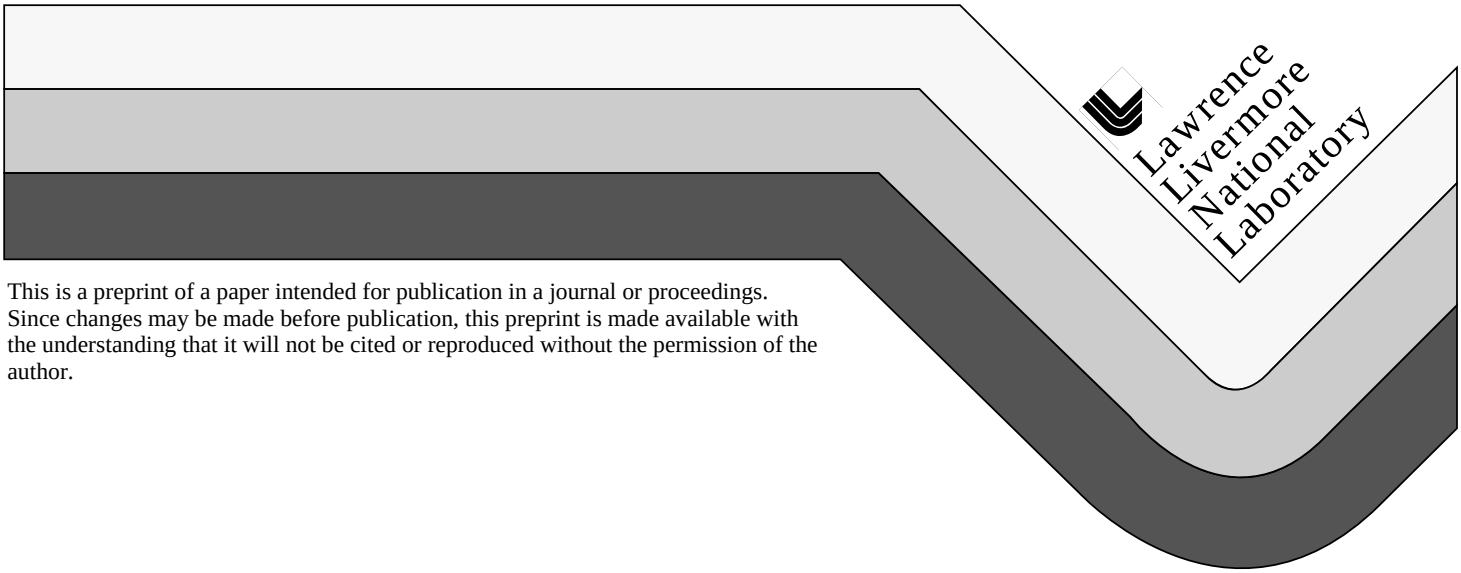

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U.S. DEPARTMENT OF ENERGY
STANDARDIZED RADIATION SAFETY TRAINING

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INTRODUCTION

Over the past eight years, the U.S. Department of Energy (DOE) has developed and implemented standardized core training for general employees, radiological workers, radiological control technicians, and other groups such as ALARA engineers. Standardized core materials consist of program manuals, lesson plans, study guides and, for some courses, computer-based training. This paper addresses the history, the process, and the courses now available as a result of this effort.

In 1988, the DOE issued a revised Radiation Protection Order that addressed three levels of training: general employee, radiation worker, and radiological control technician (RCT). This order included a list of topics to be covered, a requirement for retraining every two years, and a requirement for written examination. In the spring of 1991, the DOE approached the Training Resource and Data Exchange (TRADE) Radiation Protection Training Special Interest Group (RPTSIG), a DOE- sponsored group supporting contractor training, to develop a radiation worker course for DOE personnel that would grant them reciprocity for their training throughout the DOE complex. A group representing a cross section of DOE facilities was organized to develop a general employee radiation training (GERT) course and a radiation worker training course.

There was a great deal of interest on the part of DOE contractors to adopt this DOE course for their facilities. A pilot was scheduled for the fall of 1991, but had to be postponed due to scheduling conflicts. In January 1992, the effort was again put on hold while DOE developed the Radiological Control Manual (RadCon Manual) — the implementation of which would be required of all DOE contractors. A meeting of subject matter experts was convened to develop the RadCon Manual, including a chapter on radiation safety training. In the RadCon Manual, an effort was made to define radiation safety training requirements as addressed in numerous DOE Orders and "guides to good practices." The DOE then decided to develop standardized core training to implement the requirements of the RadCon Manual and to provide a consistent baseline of knowledge for all DOE general employees, radiation workers, and technicians. The GERT and radiation worker training courses developed for TRADE formed the basis for the first two categories of training.

The RadCon Manual also addressed a number of “other” target groups identified by DOE Orders and guides. Although these "other group" requirements were not part of the initial DOE core training, the DOE committed the development of training guides/courses for these “other” groups to the Defense Nuclear Facility Safety Board, a congressional oversight group. The following working groups were formed under the direction of a radiological training coordinator:

- Managers
- Supervisors
- DOE auditors
- ALARA engineers, schedulers, planners
- Radiological control personnel (dosimetrists, calibration technicians, etc.)
- Radiation-generating device operators
- Emergency responders
- Visitors
- Plutonium facilities
- Uranium facilities
- Tritium facilities
- Accelerator facilities
- Biomedical researchers

A portion of this work was supported by DOE Defense Programs; however, most of the effort was performed voluntarily by various contractors throughout the DOE complex. Courses, or training guides, were developed as consensus documents. A working group of contractor personnel, both instructors and subject-matter experts, met to establish course goal(s), identify target audiences, and define objectives. Writing assignments were made, a project coordinator was designated, and an editor was assigned. Draft materials were sent for review and comment to a wide distribution, in some cases outside of DOE. Formal pilots were conducted and materials were revised accordingly.

Concurrent with developing and implementing the RadCon Manual, a parallel effort was underway to shift DOE from Orders implemented through contractual agreements to regulatory requirements published in the U.S. Code of Federal Regulations. This effort was and is directed by the Price Anderson Amendments Acts (PAAA) of 1988. Implementation Guides for the 10 CFR 835 were written referencing the core and "other" training mandated by the RadCon Manual. A proposed revision to the rule, published in December 1996, would lessen the requirements for standardized training. Although the flexibility for training requirements is welcomed, there is concern about maintaining a good training program if there is no regulatory oversight. The current training materials are and will be issued as DOE Technical Standards.

Listed below are general courses that are currently available and applicable (with slight modification, in some cases) to both DOE and non-DOE facilities. Standard training materials include: program management manual, lesson plans, study guides, and overheads. Some courses are available as computer-based training (CBT). The length of each course is approximate, depending on the target audience and the amount of site-specific material that is included.

General Employee Radiological Training. A short (approximately one hour) overview of radiation safety. This course will also be available as CBT in Authorware.

Radiological Worker. A one- to two-day course. An older CBT version is available on laser disk, which is being updated in Authorware.

Radiological Control Technician. This course includes 120 hours of fundamental academics and another 120 hours of site academics. The course is available for self-study on computer in Word Perfect 5.1. A CBT version is being developed by Sandia National Laboratory.

Auditors. Although this 40-hour course was developed for DOE auditors, most of the information is generic. The prerequisite is a background in health physics or a 40-hour course conducted by Oak Ridge Associated Universities (ORISE). Both the prerequisite course and the auditors course are offered periodically through ORISE.

ALARA for Technical Support Personnel. This is a one- to three-day course and involves a number of group exercises.

Radiation-Generating Device Operators. This four-hour course is a stand-alone radiation worker course in that it incorporates applicable portions of the standardized core radiological worker training course. A CBT version is being developed by Lawrence Livermore National Laboratory.

Emergency Responders. This class was sponsored by the State of Idaho and DOE. It consists of a basic core course, with modules tailored to specific responder groups: fire fighters, security/law enforcement officers, receiving medical staffs, emergency medical technicians, ambulance drivers, etc.

Plutonium Facility Training. This four-hour class is designed as an orientation for personnel assigned to a plutonium facility. The material also serves as the core of the generic facility-specific training for radiation workers in a plutonium facility.

Uranium Facility Training. Similar to the plutonium facility training, but for uranium facilities.

Tritium Facility Training. Similar to the plutonium facility training, but for tritium facilities.

Accelerator Facility Training. See paper on Accelerator Facility Training for a full description of this course.

Contamination Control for Biomedical Researcher. This four- to eight-hour course covers radioactive material handling for biomedical researchers.

AVAILABILITY

The DOE standardized training is now or soon will be available as handbooks from the DOE. These handbooks contain the following documents:

- Program Management Guide — contains detailed information on how to use the handbook material.
- Instructor Guide — contains a lesson plan for the instructor, including notations where site-specific information should be incorporated.
- Student Guide — contains handout materials, which also should be augmented with site-specific information.
- Overhead Transparencies — recommended overheads for augmenting the classroom presentation.
- Lessons Learned — a "holding point" document for including information on site-specific lessons learned.

The handbooks are produced in WordPerfect 6.1 and are formatted for printing on an HPIII (or higher) Laser Jet printer. The overhead transparencies are produced in Harvard Graphics 3.0 for windows. Copies of these handbooks may be obtained either from the DOE Radiation Safety Training home page (http://tis-nt.eh.doe.gov/wpphm/rst/rst.html) or from the DOE Technical Standards Program Internet site (http://apollo.osti.fov/html/techstds/techstds.html). Documents downloaded from the DOE Radiation Safety Training home page may be manipulated using the software noted above (current version or higher) or converted to a Microsoft Word document for either PC or Macintosh systems.

Lawrence Livermore National Laboratory initially created a number of these documents in Word 5.1 and 6.0 for the Macintosh. The Laboratory also developed extensive overhead transparencies and electronic presentations in Aldus Persuasion.

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